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FINLAND

SELECTED ISSUES

January 2026

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December 10, 2025

Approved By
European Department

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CONTENTS

THE IMPACT OF ARTIFICIAL INTELLIGENCE ON FINLAND'S LABOR MARKET[1]

Artificial Intelligence (AI) is rapidly evolving and has the potential to reshape the job landscape across a broad range of skills and sectors. While most Finns will benefit from AI adoption, one-fifth of the workforce is at risk of job displacement. Women, highly educated workers, and non-immigrants are likely to benefit most. In contrast, men, low-educated people, and immigrants may gain less from AI adoption, primarily because they occupy jobs with low exposure.

A. Context

1. Artificial Intelligence (AI) and Generative AI models have made significant advances in recent years. These models have evolved from traditional machine learning frameworks to performing advanced cognitive functions, processing vast amounts of data, identifying patterns, and making decisions. Compared to previous technological innovations, the speed of AI adoption by workers and firms is unprecedented (Mish et al., 2025), and companies are in a competitive race to develop AI-driven products. As a result, AI has the potential to significantly enhance productivity across various sectors and occupations, potentially reshaping the job landscape. However, it remains uncertain whether AI technologies will complement or substitute specific occupations, and at what pace this will unfold.

2. The structure of this chapter is as follows. Section B assesses Finland's digital preparedness and potential to harness the benefits of AI, using the IMF's AI Preparedness Index (AIPI) and other indicators of digital skills, perception, and AI adoption by companies. Section C examines the characteristics of the Finnish labor market by mapping an index of exposure and complementarity onto occupational microdata. Section D concludes and discusses policy implications.

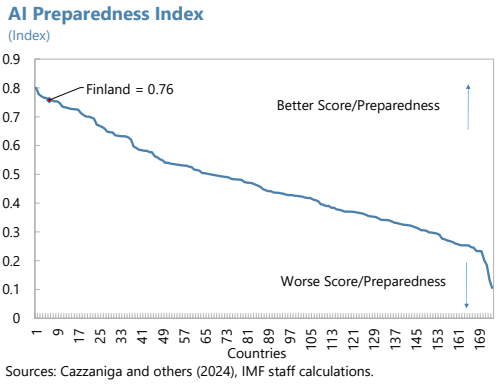
B. Infrastructure, Human Capital, and Digital Preparedness in Finland

3. Finland is well-prepared to benefit from AI. The IMF's AI Preparedness Index (AIPI) ranks Finland among the most prepared countries for the AI transition, indicating its strong position to harness the benefits and mitigate the risks of AI.[2] This preparedness, shared with other Nordic countries, is marked by solid innovation and legal frameworks, alongside a robust digital infrastructure (see Figure 1). For example, Finland hosts Europe's most powerful supercomputer, LUMI, whose immense computing power drives cutting-edge research in fields such as climate science and cancer research.

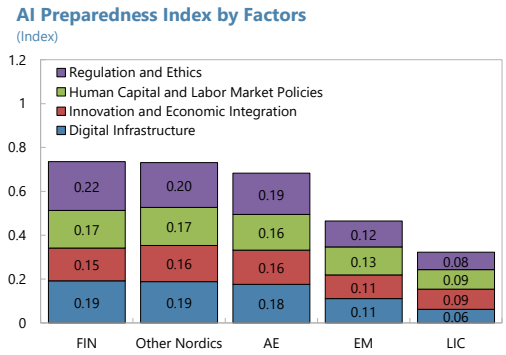
[1] Prepared by Théodore Renault (EUR).

[2] The IMF's AIPI (Cazzaniga et al., 2024) assesses AI preparedness as of 2023 across 174 countries, based on a comprehensive set of macro-structural indicators that cover digital infrastructure; innovation and economic integration; human capital and labor market policies; and regulation and ethics. The index incorporates several perceptions-based indicators, reflecting individuals' subjective assessment and experiences. Therefore, the index should be seen as an indicative measure.

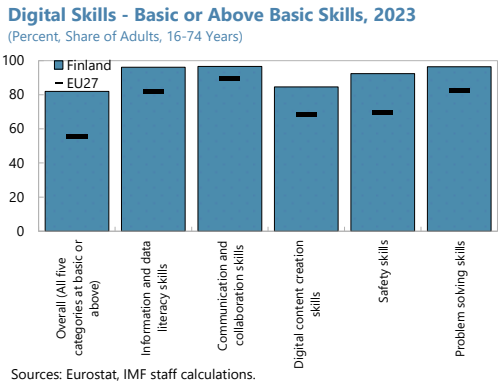
Figure 1. AI Preparedness, Digital Indicators and Electricity Prices



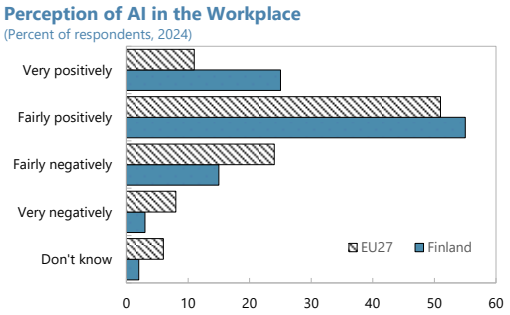
Sources: Cazzaniga and others (2024), IMF staff calculations.



Sources: Cazzaniga and others (2024), IMF staff calculations.



Sources: Eurostat, IMF staff calculations.

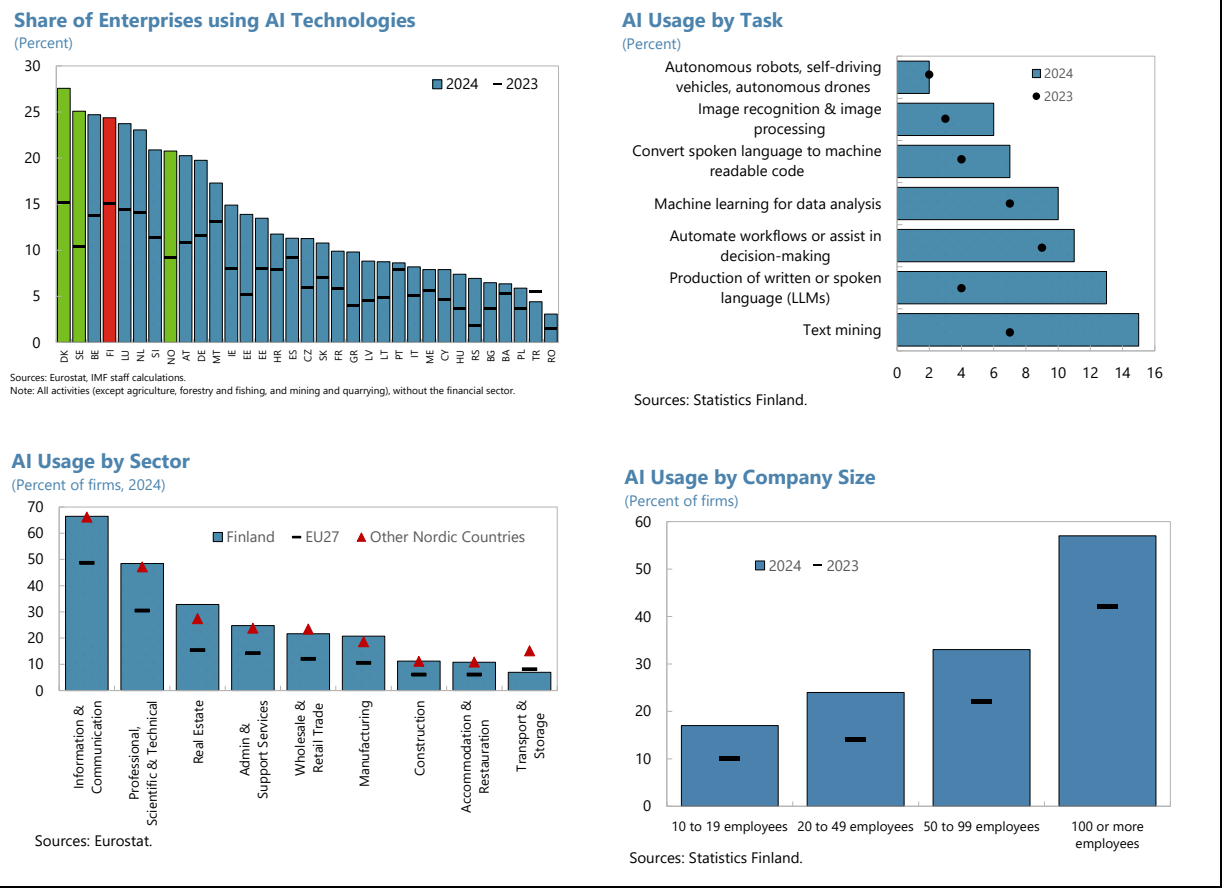


Sources: Eurobarometer "Artificial Intelligence and the future of work".
Note: response the question: "How positively or negatively do you perceive the use of roborts and Artificial Intelligence in the workplace?"

4. The Finnish labor force is well-educated and tech savvy. Finland's vibrant AI ecosystem (e.g. ELLIS Institute, Finnish Center for Artificial Intelligence) actively attracts AI experts through strong public-private partnerships involving universities, government, and industry. More broadly, digital skills in Finland are higher than in other European countries for both simple and complex tasks. Furthermore, a majority of Finns view positively the use of AI in the workplace, while most companies report satisfaction with the outcomes AI delivers (AI Finland, 2025). This favorable environment will likely accelerate AI adoption among workers and firms.

5. AI usage in Finnish companies is among the highest in Europe. In 2024, 25 percent of Finnish companies with 10 or more employees were using at least one AI technology (see Figure 2). This figure nearly doubled in one year, indicating a rapid pace of adoption among firms. Finnish companies were primarily using AI technologies for text mining (14 percent), natural language generation (13 percent) along with workflow automation and machine learning for data analysis. The highest adoption rate is in the information and communication sector (70 percent), followed by professional, scientific, and technical activities (50 percent). Other sectors, such as real estate (33 percent) and manufacturing (21 percent), also show significant AI usage compared to other European countries.

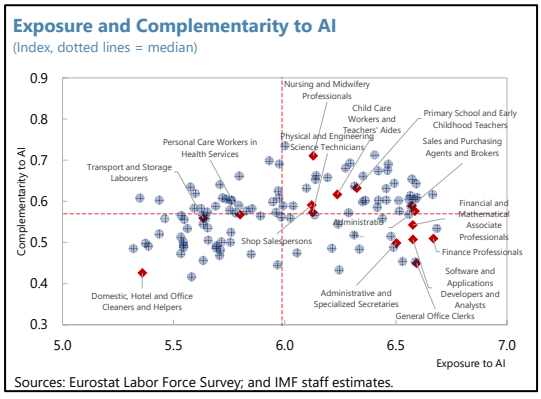
Figure 2. Use of Artificial Intelligence (AI) in Companies



6. The use of AI increases with firms' size. In 2024, 60 percent of firms with 100 or more employees were using AI, compared to only 20 percent of small firms with less than 20 employees and 30 percent of medium-sized firms. This difference might be explained, for example, by the complexity of implementing AI technologies (i.e., large firms have more IT-related resources), economies of scale (given the initial fixed costs of AI investment), and costs.

C. Labor Market Exposure and Complementarity to AI

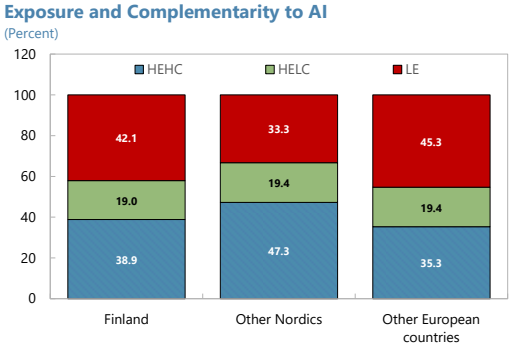
7. There is significant variation in exposure and complementarity to AI across job types. Felten et al. (2021) developed a measure of occupational exposure to AI, linking AI applications to workplace skills and occupations using U.S. data. Building on this, Pizzinelli et al. (2023) incorporated the social, ethical, and physical contexts of occupations to assess whether AI is likely to complement or replace jobs. Based on this framework, occupations are classified into three categories: "High Exposure and High Complementarity" (HEHC), "High Exposure and Low Complementarity" (HELC), and "Low



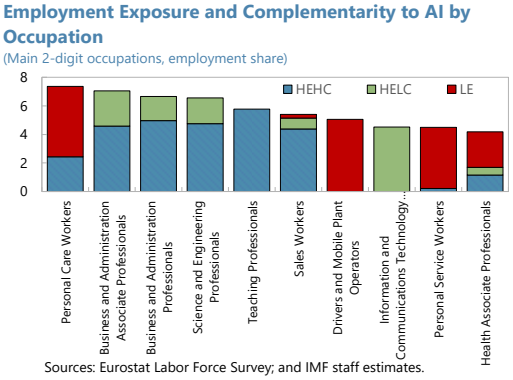
Exposure". These classifications are applied to the 2023 EU Labor Force Survey, allowing an assessment of AI exposure and complementarity within the Finnish workforce and in comparison with other European countries, across 119 occupations, 19 economic activities, three age groups, gender, three educational attainment groups, and two country-of-birth groupings.

8. The Finnish labor force faces a higher level of exposure to AI compared to other European countries. Around 40 percent of Finnish workers hold jobs with high exposure and high complementarity to AI, primarily in business, teaching and science and engineering professions (see Figure 3). The share is slightly higher than in other European countries but 8½ percentage points lower than in other Nordic countries.[3] Despite the high exposure, these workers are likely to benefit from AI adoption. Conversely, about 20 percent of the workforce—similar to other European countries—occupy jobs with high exposure but low complementarity to AI, such as software developers, finance professionals, and administrative staff, placing them at greater risk of job displacement. Finally, around 40 percent of the Finnish workforce is unlikely to be affected by AI, primarily those employed in personal care, personal services or as drivers.

Figure 3. Exposure and Complementarity to AI



Sources: Eurostat Labor Force Survey; and IMF staff estimates.



Sources: Eurostat Labor Force Survey; and IMF staff estimates.

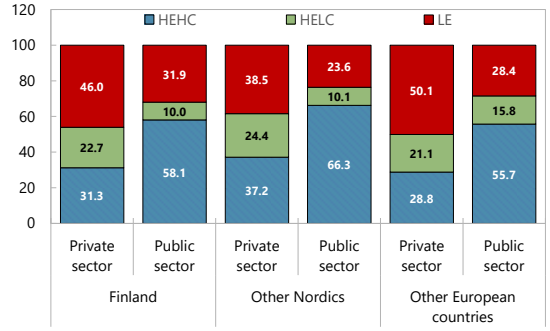
9. Private sector workers are more vulnerable to job displacement than those in the public sector. Approximately 25 percent of the Finnish private sector workforce faces a risk of job displacement, in contrast to only 10 percent of the public sector workforce. The most at-risk private sector jobs include software developers, finance professionals or secretaries. On the other hand, more than half of public sector employees are anticipated to benefit from AI advancements, particularly those in education and healthcare. However, AI may also allow for the reallocation of labor resources within public administration, particularly for jobs like secretaries, administrative and financial professionals (e.g. accountants). Compared to its European peers, potential job displacement in the public sector is similar than in other Nordics, but lower than in the rest of Europe.

[3] The term "highly exposed" should be used with caution. It refers to job occupations with an exposure score higher than the median across occupations, based on the Felten et al. (2021) occupational exposure index. It therefore measures exposure in a relative sense against all other occupations, rather than absolute terms.

Figure 4. Sectoral Differences

Exposure and Complementarity to AI by Broad Sectors

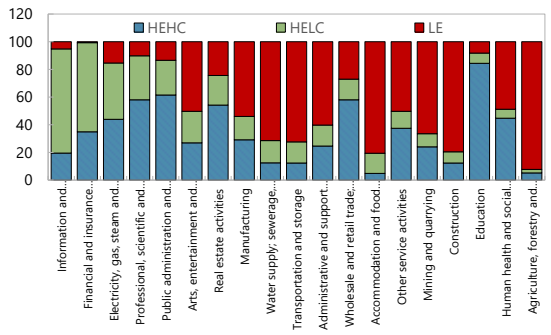
(Percent)



Sources: Eurostat; and IMF staff estimates.

Exposure and Complementarity to AI by Sector

(Percent)



Sources: Eurostat Labor Force Survey; and IMF staff estimates.

10. Women, highly educated workers, and non-immigrants are expected to significantly benefit from AI.

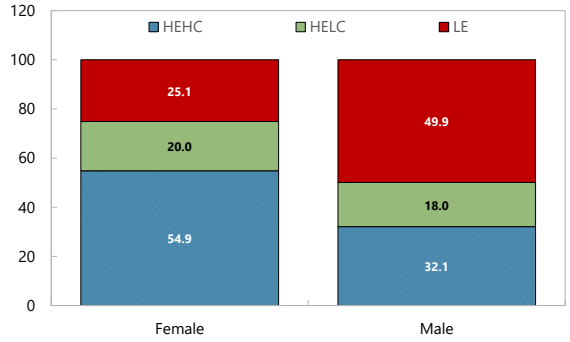
- Nearly 75 percent of the female workforce is highly exposed to AI, but a substantial majority are in jobs with high complementarity, largely due to women's predominance in education or healthcare. In contrast, half of the male workforce has low exposure to AI, as men are more likely to work in construction or transport.

- Highly educated workers are anticipated to benefit the most from AI technologies, although ¼ of these workers could be at risk of job displacement. In contrast, the risk of job displacement for low-educated workers is low, as they generally have low exposure to AI.

- The impact of AI is not expected to differ significantly across age groups. Finally, Finnish citizens are anticipated to benefit more than immigrants, as immigrants tend to occupy jobs with low exposure to AI.

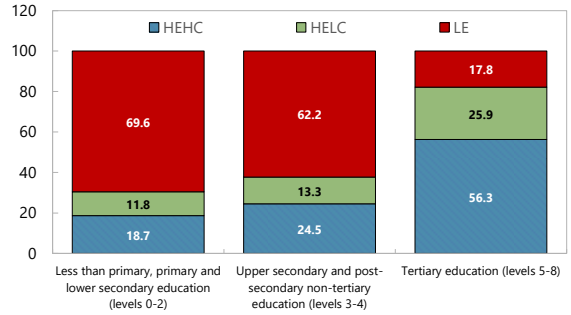
Figure 5. Gender, Education, Age and Immigrants

Gender - Employment Exposure and Complementarity to AI
(Percent)



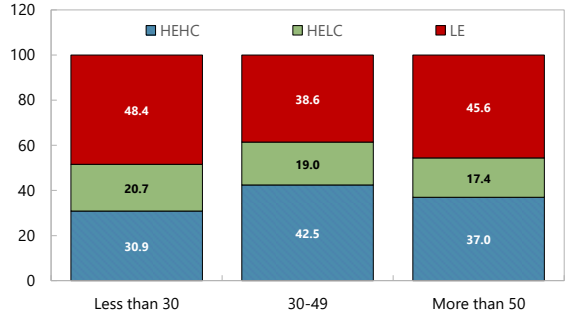
Sources: Eurostat Labor Survey; and IMF staff estimates.

Education - Employment Exposure and Complementarity to AI
(Percent)



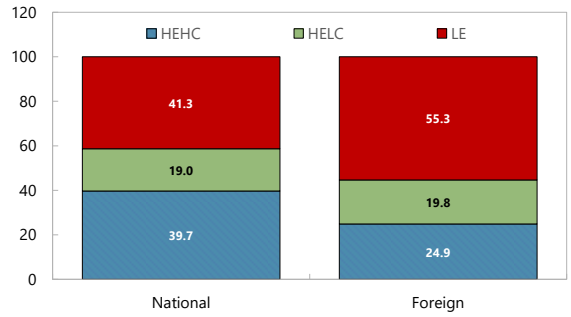
Sources: Eurostat Labor Force Survey; and IMF staff estimates.

Age - Employment Exposure and Complementarity to AI- Finland
(Percent)



Sources: Eurostat Labor Force Survey; and IMF staff estimates.

Immigrant - Employment Exposure and Complementarity to AI
(Percent)



Sources: Eurostat Labor Force Survey; and IMF staff estimates.

D. Conclusions and Policy Considerations

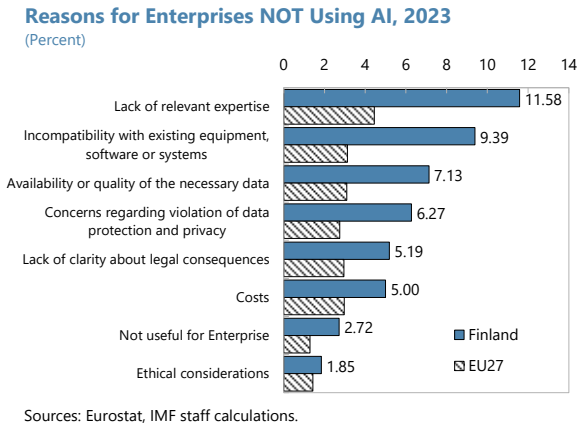
11. Finland is well-prepared to reap the benefits of AI. A highly educated and tech-friendly workforce makes Finland resilient to the challenges posed by AI adoption. Compared to other European countries, Finland has a higher share of workers with high-complementarity occupations and a lower share of low-exposed workers. Nevertheless, Finland faces similar vulnerabilities as other European nations regarding adverse labor market impacts, with approximately one-fifth of its workforce at risk of job displacement.

12. The impact of digital technologies on labor markets should be closely monitored. So far, AI adoption had little impact on Finnish employment (Kauhanen and Rouvinen, 2025), but the rapid adoption and technological change of AI may lead to faster- and larger-than-expected job displacement.[4] At the same time, few Finnish workers are receiving an AI training at their workplace (Federation of Finnish Enterprises, 2025). In this context, Staff welcome Ministry of Economic Affairs and Employment's recommendations to provide high-quality courses in AI and enhance vocational

[4] Recent evidence for the United States suggests steady declines in employment for early-career workers occupying jobs with high exposure (e.g. software developers) to AI after 2022 (Brynjolfsson et al, 2025).

training and lifelong learning for the Finnish workforce.[5] Furthermore, a more agile tertiary education system that facilitates upskilling and reskilling, and better aligned with employer needs, will be crucial to facilitate to adopt AI technologies among firms.

13. Supporting the adoption the AI technologies in the private sector, especially in SMEs, is necessary to fully harness the benefits of AI. In 2022, the authorities launched an *Artificial Intelligence Programme* aimed at accelerating the adoption of artificial intelligence (AI) and digital technologies among SMEs. This commendable initiative notably promotes collaboration between SMEs, large companies, and research institutes. Moreover, while early-stage AI startups have access to public funding and support (e.g. through Business Finland), they face difficulties in scaling up (2025 Article IV; Business Finland, 2025). As a result, Finnish firms identify insufficient investment as a key obstacle to scaling AI (AI Finland, 2025). Further European integration, by reducing internal barriers at the EU-level or strengthening European and Nordic cooperation, would help Finnish companies to access larger markets and attract foreign capital. Finally, policies focused on attracting and retaining foreign talent are vital, as many Finnish companies identify a shortage of relevant expertise as an obstacle to AI adoption**.**



Sources: Eurostat, IMF staff calculations.

14. AI represents an opportunity to free up resources in the public sector. Public sector organizations lag behind private companies in adopting AI technologies and tend to implement them in silos, leading to inefficiencies (AI Finland, 2025). While private sector workers are expected to be the most affected by AI, only 10 percent of public sector employees hold low-complementarity positions. Therefore, accelerating AI adoption in the public sector represents an opportunity to free up resources, reduce administrative costs, and improve public services.

[5] See Finland's Artificial Intelligence 4.0 Programme (2022).

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Annex I. Measuring Exposure and Complementarity to AI

1. Measuring Exposure to AI. Felten et al. (2021) develop a measure of occupational exposure to AI, linking 10 applications of AI (e.g., image recognition, text creation) to 52 occupational abilities (e.g., oral comprehension, inductive reasoning), using U.S. occupational characteristics from the O*NET database. Each occupation can be seen as a combination of the 52 abilities, weighted by the degree of importance and complexity of such skills in each job.

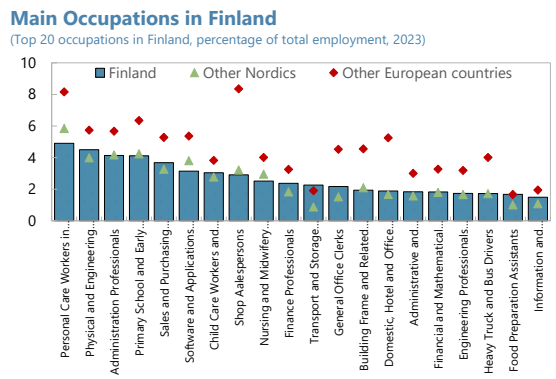
2. Measuring complementary to AI. Pizzinelli et al. (2023) develop an index of complementarity by using two additional dimensions from the O*NET database: 'work contexts' and 'job zones.' They identify 11 contexts relevant work contexts for AI, which they group, together with the job zones, into six components: communication, responsibility, physical conditions, criticality, routine, and skills. This framework helps to determine how AI can complement or substitute specific occupations.

3. Bringing exposure and complementary together conceptually. The measures of exposure and complementarity can conceptually be thought of as a matrix of three dimensions: 'High Exposure and High Complementarity' (HEHC), 'High Exposure and Low Complementarity' (HELC), 'Low Exposure' (LE), using the medians across all exposure and complementarity values as thresholds. The measure of High Exposure and Low Complementarity can be interpreted as occupations which are at higher risk of job displacement.

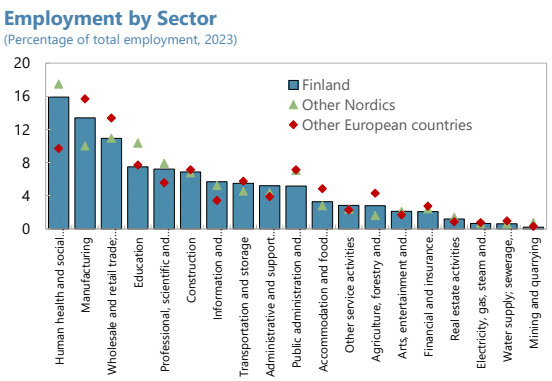
Annex II. Employment by Occupation and by Sector

1. The health and manufacturing sectors account for a significant share of employment in Finland. Approximately 30 of Finnish employees work in the public sector, namely in public administration (5 percent of total employment), education (8 percent), and healthcare (16 percent). The share of workers in the health sector is higher than in other European countries, but lower than in other Nordics. This trend is reflected in the types of jobs held by workers, with many Finnish employees serving as personal care workers, primary school teachers and childcare workers. Manufacturing is another important sector, representing 13 percent of total employment, with physical and engineering science technicians being Finland's second-largest occupation. Lastly, administrative professionals, who work in both the private and public sectors, constitute a significant share of the workforce.

Annex II. Figure 1. Employment by Occupation and by Sector



Sources: Eurostat Labor Force Survey; and IMF staff estimates.



Sources: Eurostat Labor Force Survey; and IMF staff estimates.